PART I - SECTION C
DESCRIPTION /SPECIFICATIONS/WORK STATEMENT

APPENDIX C – CONCEPT OF USE FOR REPLACEMENT VOICE SWITCH

This concept of use describes the operational concept and performance capability for Air Traffic Services (ATS) voice communications in Automated Flight Service Stations (AFSS).

Background
The complete ATS voice communications system at existing AFSSs consists of all the systems, equipment and circuits necessary to enable flight service specialists to communicate by voice with each other, with pilots, and with external agencies, including other facilities. The complete system is made up of a number of subsystems and components.

Voice communications by flight service specialists are conducted over various categories and types of circuits that are often dedicated to communications throughout the National Airspace System (NAS). The circuits provide operators with an air/ground A/G and ground/ground G/G voice message exchange capability.

Communications systems have evolved from hard-wired, dedicated, special-purpose equipment to computer-based systems with switching and reconfiguration capabilities. Current systems still require a large amount of space at facility workstations and do not provide the most efficient and effective access to communications functions and resources. The existing systems do not provide the capability to redistribute air/ground frequencies between AFSSs.

Operations Environment
The voice switch will provide the voice capability for A/G and G/G communications. The switch will make maximum use of the existing Automatic Call Director (ACD) and Voice Retrieval System (VRS). It will interface with existing interphone networks consisting largely of government-furnished point-to-point and multi-unit dedicated lines. The switch will interface with external telephone networks such as Private Automated Branch eXchange (PABX) and Federal Telephone Systems (FTS). Some AFSS facilities have private phone companies that the switch will interface with. This switch will also interface with government-furnished A/G communications equipment and other legacy equipment. The switch will be engineered for minimum intended service life of ten years.

Operational Capabilities
The objectives of identifying the capabilities described in this document are to provide AFSSs with a voice communications system that:

a) has a high degree of reliability and availability;
b) requires minimal space at workstations;
c) provides efficient, effective and ergonomically-sound communications interfaces at flight service specialist workstations;
d) minimizes operator distractions and interruptions by providing simple, interactive, operator-friendly devices, prompts and processes that use ordered task priorities;
e) is not affected by failures of other unit systems or their components;

f) provides a high degree of flexibility by incorporating capabilities to configure and reconfigure positions through site adaptation and configuration maps from the area supervisor position;
g) provides the capability to offload (redistribute) A/G and G/G communications to other facilities. (see Attachment 1)

OPERATIONAL PERFORMANCE

General

Positions in AFSSs shall be able to effectively and efficiently establish two-way A/G and G/G communications. To the degree possible, voice quality shall be high and clear of static, noise, undesirable signals and interference. Voice clipping is unacceptable.

Specialists shall be able to use any combination of headset, handset, speaker and microphone devices to receive incoming voice and/or transmit voice messages on interphone, public telephone circuits, direct and indirect access circuits and air/ground radio communications circuits.

Specialists shall have the ability to manage radio frequencies, by enabling/disabling a frequency (or group of frequencies), selecting main/standby transmitter/receiver, selecting audio routing and volume level, enabling/disabling the muting control and adjusting the receive volume.

POSITION OPERATION

Ground/Ground Communications

General

The majority of G/G voice communications will be conducted over public line circuits. Secondary dedicated circuits, such as direct and indirect access circuits, are used for communication within the AFSS and connection to other facilities. Public circuits, such as telephone circuits, are used for communication with external agencies and for some communications internal to the AFSS and to other facilities. Specialists must have the ability to establish communications on all circuits and/or monitor the status of usage for the circuits.

Interphone Circuits

These dedicated circuits provide the ability for specialists to establish voice communication on circuits dedicated for use by the FAA. The AFSS will be required to have access to interphone circuit(s) which allows for internal communications to the AFSS and connection to associated facilities.

Each position shall have the capability of initiating calls by selecting individual interphone circuits and manually dialing or direct dialing to establish voice communications. Positions shall have the capability of answering and releasing incoming calls directed to that position.

PART I - SECTION C
DESCRIPTION /SPECIFICATIONS/WORK STATEMENT

Direct/Indirect Access Circuits
These dedicated circuits provide the ability to instantly access external and/or internal priority circuits to enable voice communications with other positions within the AFSS and/or with positions in external facilities.

Each position shall have the capability of initiating, answering and releasing calls directed to that position.

Public Switched Telephone Circuits
These circuits provide the AFSS with the ability to access public telephone circuits for establishing internal and external voice communications.

Each position shall have the capability of initiating calls by selecting individual telephone circuits and manually dialing or direct dialing to establish voice communications. Positions shall have the capability of answering and releasing incoming calls directed to that position.
.
The voice switching system shall provide call features such as speed dial, call hold, call forward, call transfer, call override, caller identification and call conference. The call conference feature shall support a minimum of ten participants.

ACD technology is required to provide the effective management of the large number of telephone calls received by the AFSS. ACD technology can be applied at the network level for the routing and screening of calls through automation, at the VRS and for the routing, queuing and identification of call priority at the facility level.

Access to the AFSS using public telephone circuits will normally be via toll-free numbers routed to the appropriate AFSS based on geographical area by the telco router or via a local telephone number. Other telephone numbers may be designated for use by an AFSS to provide for specific use (ex: Search and Rescue (SAR), airport managers). Calls associated with these numbers will be routed via the ACD to the appropriate position(s).

Air/Ground Communications
General
AFSSs require the ability to establish A/G and G/G radio communications, at local facilities and remote facilities using various circuits. Radio communications are established over dedicated circuits locally and remotely. Specialists must have the ability to establish communications on all circuits and monitor the status and usage for the circuits.

Each position shall have the capability of initiating calls by selecting an individual radio circuit or circuits, activating the circuit(s) by a push-to-talk device, and receiving incoming transmissions directed to that position.

PART I - SECTION C
DESCRIPTION /SPECIFICATIONS/WORK STATEMENT

POSITION REQUIREMENTS

General

The voice switching system shall be scalable and capable of supporting the number of frequencies and positions required to meet operational needs.

Position Features

The system shall provide manually selected automated position diagnostic test functions to confirm the proper operation of a position, including position processors and lighting features. Diagnostic testing shall cause no service interruption or change to position configuration or settings.

Positions shall receive notification of pending configuration changes. The system shall require a positive acknowledgement from the position prior to implementation of the configuration change.

Positions shall have a one-touch "mute-all-others" capability. This function will mute all frequencies except those selected, and will provide a visual reminder to the specialist that the "mute-all-others" function is in use.

Position Configuration

Each position shall have the capability to access any circuit or frequency available to the AFSS.

The system shall provide the capability for any position to perform A/G and/or G/G functions as assigned by facility management.

Headset/Handset/Speaker/Microphone Operations

Positions shall be able to receive audio and voice by headset, handset or speaker, and transmit on selected circuits by headset, handset or microphone.

Dual Operation

Each position shall have the capability to monitor trainee/specialist transmissions during headset and handset operations. During instructor/supervisor monitoring shall have the capability to preempt trainee transmissions on radio frequencies by activation of the instructor/supervisor push-to-talk (PTT) function.

When preemption occurs the trainee/specialist positions shall continue to have receive capability.

Position Relief Recording

The voice switching system shall provide the capability to manually connect with existing AFSS recorders to record the official position relief dialog exchanged between a departing specialist and a relief specialist at individual positions.

Position Lockout

The voice switching system shall provide the capability of locking out access to individual position functions when that position is unattended.

PART I - SECTION C
DESCRIPTION /SPECIFICATIONS/WORK STATEMENT

Supervisor Functions
General
The supervisor's position shall be the AFSS control position. The supervisors shall have the capability to monitor alarms, make changes to frequency assignments, position assignments and call functions through a system of pass codes which allow limited access to different levels of position configuration functions.

Position Reconfiguration
Assignment of A/G and G/G functions for each position shall be performed at the supervisory position. Supervisors shall have the capability to make changes to all position and frequency assignments.

Position Monitoring/Recording
Supervisors shall be able to selectively monitor all AFSS positions. Supervisory monitoring shall be undetectable by the positions being monitored.

The supervisor's position shall have the capability of recording at least two positions independent of the AFSS multi-channel recorders.

SYSTEM REQUIREMENTS

Computer Human Interface (CHI) Requirements
The specialist interface with the input/output (I/O) devices used to exercise voice communications system functionality shall be as simple, effective and efficient as possible. Associated specialist workload and distractions shall be minimized. The preferred method for CHI interface is via touch screen with a display size that is compatible with the position consoles, large enough so that displayed information is easily readable, and is accessible to individuals of various physical capabilities.

The preference is for a color display that is resistant to reflection and glare associated with lighting levels.

Split-screen functionality is required to display A/G, G/G and dialing functions on the main screen. A "solution box" containing location identifier, frequency value and select/deselect functions shall appear when an incoming call is received. In addition, the display shall provide some type of search function for quick access to specific frequencies. The location identifier and frequency value fields shall support at least 12 alpha/numeric characters.

The capability to establish user preference profiles is required. These profiles will be activated at position sign on and will allow individuals to customize position functions and displays according to their preferences. As an example, automatic frequency activation when an incoming call is received, individual mapping preferences such as a one-touch "select all HIWAS outlets" or secondary pages with most commonly used frequencies, etc.

A secondary page shall contain a caller identification function and a history of calls received for the last 15-minute period.

Configuration
Supervisory positions in AFSSs shall be provided with the capability of creating, modifying and implementing configuration plans, and communications configuration maps for the facility and/or specific positions. Activation of changes to configuration plans and maps shall be implemented by the appropriate commands with minimal impact.

Off-loading
The supervisory position shall have the capability of transferring all, or a portion of, the facility's A/G and G/G communications to/from other AFSSs with transparent communication connectivity. (see Attachment 1)

Start-up and Recovery
The voice switching system shall require no more than five minutes for startup, measured from the instant of application of main power to the first instant that all positions are available for all assigned functions. Startup and recovery from shutdowns shall replicate the position configuration in use prior to shutdown. Startup or recovery following a loss of power shall not require manual intervention.

Data Archiving
The supervisory position shall provide the capability to archive, print and display the system configuration changes and history for all AFSS positions. In addition, the system shall provide reports on A/G activity.

Information Security
Information security (INFOSEC) issues will be supported via use of position login/logoff capability and a series of supervisory pass codes when performing system functions. The system will meet requirements specified by the Information Security Division, AIO-400.

PART I - SECTION C
DESCRIPTION /SPECIFICATIONS/WORK STATEMENT

OFF-LOADING